

ANNUAL REPORT 2016/17 and 2017/18

EL15/2015 SULPHIDE CREEK

WESTERN TASMANIA



Exploration Licence held by: Australian Mineral Resources
4/88 Cumberland St
The Rocks, NSW 2000

Report compiled by: Dean Delaney, April 2018

EXECUTIVE SUMMARY

AMR has held Exploration Licence 15/2015 over the Sulphide Creek area since 4 March 2016.

The Licence area is prospective for gold disseminated in shear stockworks and concentrated in vein shoots; remnant alluvial deposits and small gold/antimony concentrations. Historically, gold ore has been found in Devonian veins, but grade continuity and volume were found too unreliable for sustained mining. Gold exploration declined after 1915 until 1984. In the past thirty years mid-tier explorers have sought mainly Carlin-type disseminated deposits and large structurally-controlled ‘Henty-style’ ore bodies. Three disseminated gold deposits have been deemed encouraging with the previous tenement holder reporting potential for a total resource of 700,000 ounces. AMR assesses that current information does not support an economically recoverable resource estimate of more than 10% of that figure.

Research, mapping, geochemical sampling and preparation for drilling by AMR in 2016/2017 and 2017/2018 with expenditures of \$24 000 and \$42 000 respectively, reveal the potential also for vein-hosted gold shoots as part of, or in addition to the well-explored Coupon and Davies disseminated prospects. A looming market shortage of antimony has invigorated interest in the historical but lost Rinadeena antimony show. AMR is pursuing an integrated exploration program to define these resources to a standard warranting development investment, commencing with location and test of near-surface ore concentrations, by:

- closing the gaps in existing stream sediment and soil sample records to determine if other sheet vein deposits or structurally-controlled gold concentrations might daylight on the Licence area;
- mapping and extending soil sample grids in areas of likely above fault intersections;
- locating the historical Davies P.A. and Rinadeena deposits; and
- testing the viability and feasibility of extracting combined disseminated/vein resources by drilling the most prospective deposits.

Exploration activities in the reporting period have included:

- desktop research, assessment and re-interpretation of available geological and geophysical records and reports;
- field mapping, stream sediment sampling; and
- development of draft models.

Estimated expenditure for exploration in Year 3 of the Licence is \$60 000.

Cover photo:

The ABT West Coast Wilderness Railway runs axially down the southern half of the Lease.

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1. INTRODUCTION

Report brief

Tasmanian Exploration Licence EL 15/2015 has been held in entirety by Australian Mineral Resources Pty Ltd (AMR) throughout the reporting period 4 March 2016 to 4 March 2018.

To satisfy Section 204A of the *Mineral Resources Development Act, 1995* (MRDA), AMR submits this composite document to report on mineral exploration investigations and expenditure undertaken in the first two years of EL15/2015, and to update the nature of work proposed under the licence in the next three years.

Location

The area covered by Mineral Exploration Licence EL15/2015 Sulphide Creek is a 2 x 7 km block located 3 km south west of Queenstown on Tasmania’s west coast. The Licence area lies around 225 km from Hobart on a west north-westerly bearing – about 4 hours’ drive from Hobart along the Lyell Highway.

Queenstown Aerodrome and Mount Lyell’s Princess Creek tailings pond are located to the North. The Lyell Highway tracks along the western boundary before proceeding westward towards Strahan; and the Abt Wilderness Railway enters the Licence area mid-way along the eastern boundary and tracks southward for 4 km before exiting to the south towards the King River.

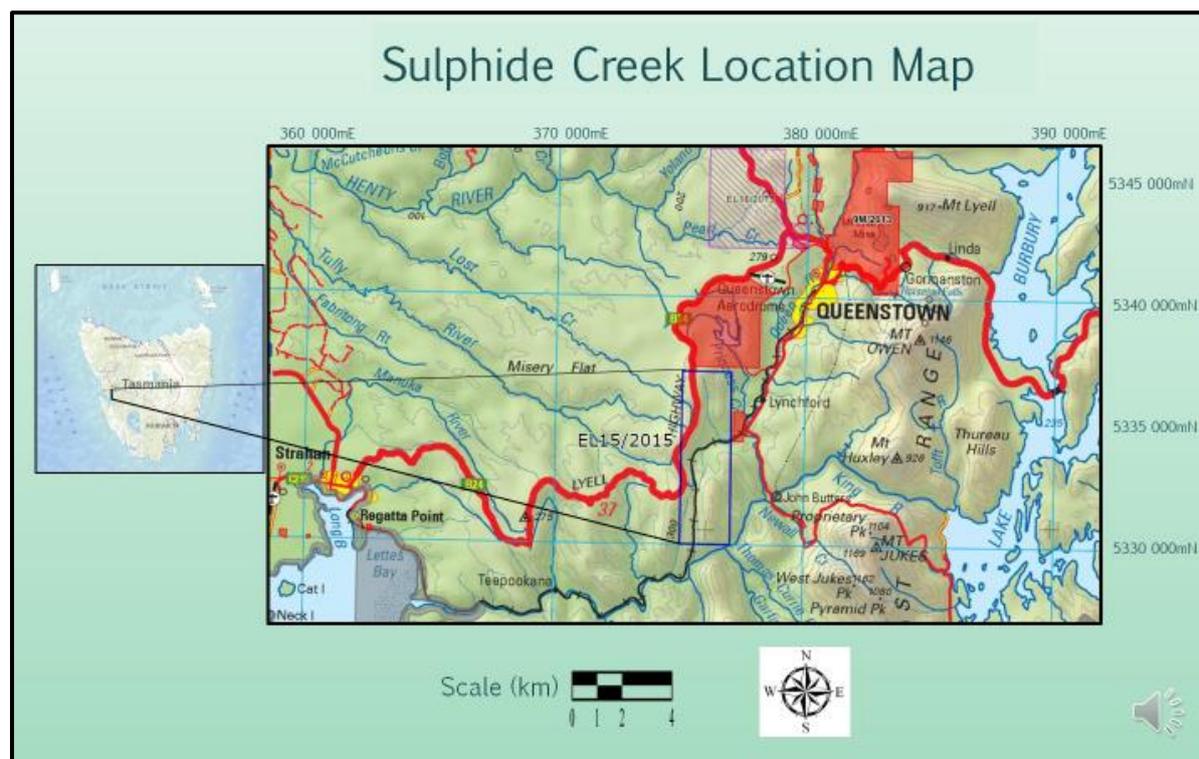


Figure 1.1: Location of EL15/2015 Sulphide Creek

Map conventions

Coordinates in this report and in digital data associated with this report are recorded as GDA94: UTM Zone 55.

Geographical setting

The topographic relief is moderate, presenting as a pattern of north-south striking valleys and ridges. One axial ridge in the south has an altitude of 400m AHD and ridges in the far north and west attain 360m, whereas creek beds depart the Licence area at about 200m. The main creeks either join the westerly-flowing section of Halls Creek in the centre of the Licence, or flow northward into Princess Creek, or southward into the King River (see Figure 1.2). The interstitial ridges between creeks rise sharply (at slopes up to 30°) up to 180 m above the stream beds.

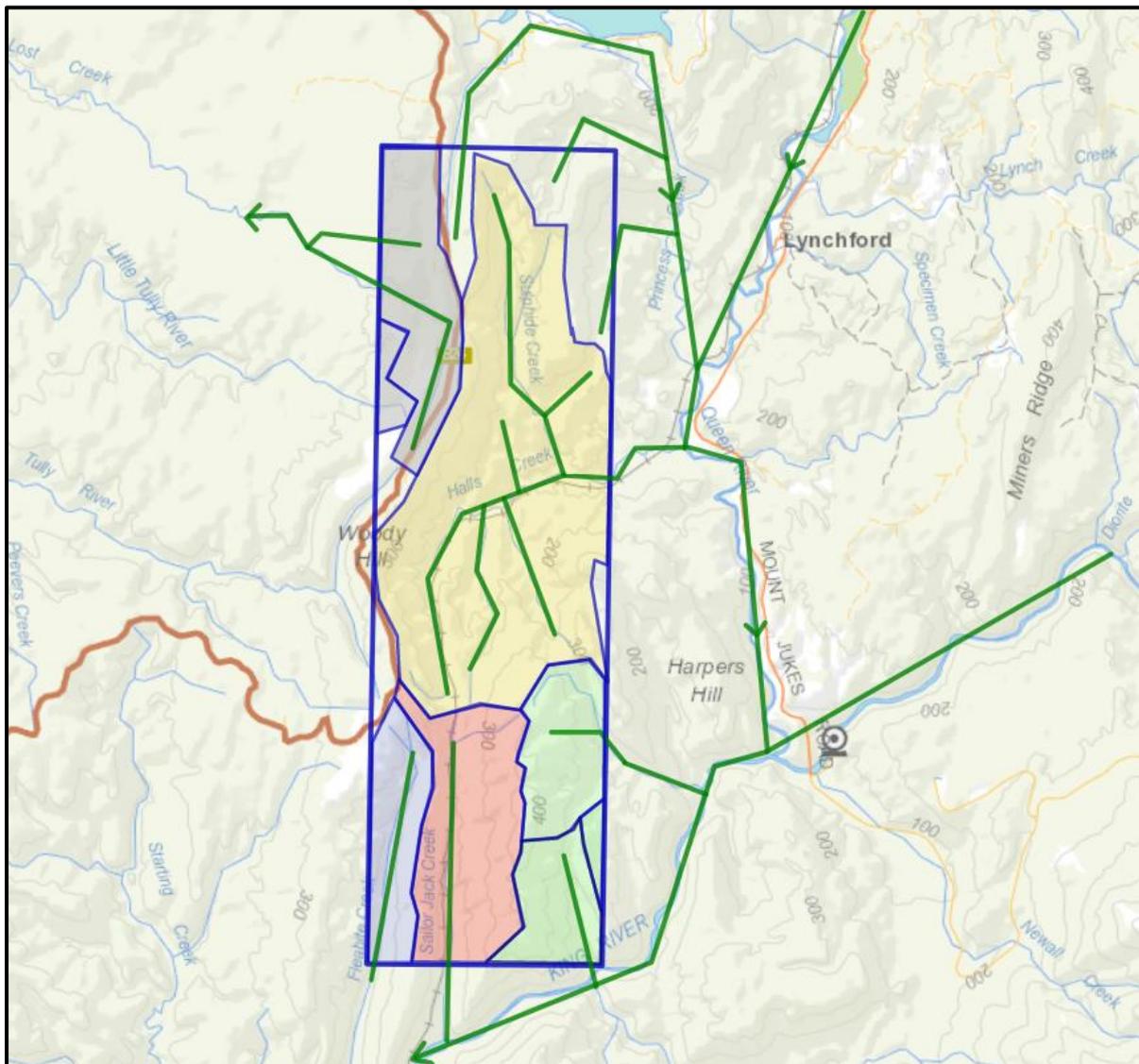


Figure 1.2: EL 15/2015 Topography and drainage pattern.

The bedrock is siliceous. Topsoil is shallow on the ridges, boggy and peaty on flats, and colluvium and humus are generally less than 30 cm deep on the gully slopes.

The ravines are heavily vegetated with thick temperate rain forest, and the ridges and plateaus with thick tea-tree dominated regrowth.

The Queenstown area has an annual average rainfall of about 2400 mm, with less than 30 days of clear skies annually, and a maximum daily temperature range of 12 to 20 degrees C.

Access

From Queenstown the tenement is accessed by road via the Lyell Highway 5 km south west of the Strahan turn-off. The highway tracks another 5 km southward through the tenement before switching westerly towards Strahan (Figure 1.1). Access from the highway for exploration is limited to an overgrown walking track some 300 m east up to the Davie prospect, and the 500m easterly road access to the Rinadeena railway stop. Access to the Coupon prospect and Harveys Creek is best arranged with the ABT Railway Ministerial Corp to follow the easement from Bradshaw’s Mill to the Halls Creek siding before veering south to the prospects.

The density and height of vegetation necessitates track cutting to reach target areas. Tea-tree (manuka), cutting grass and heath regrowth after logging and bushfire makes access difficult at the higher elevations, and in the gullies, access is restricted by rainforest species, bauera, felled wattle and banksia and the ubiquitous tea-trees.

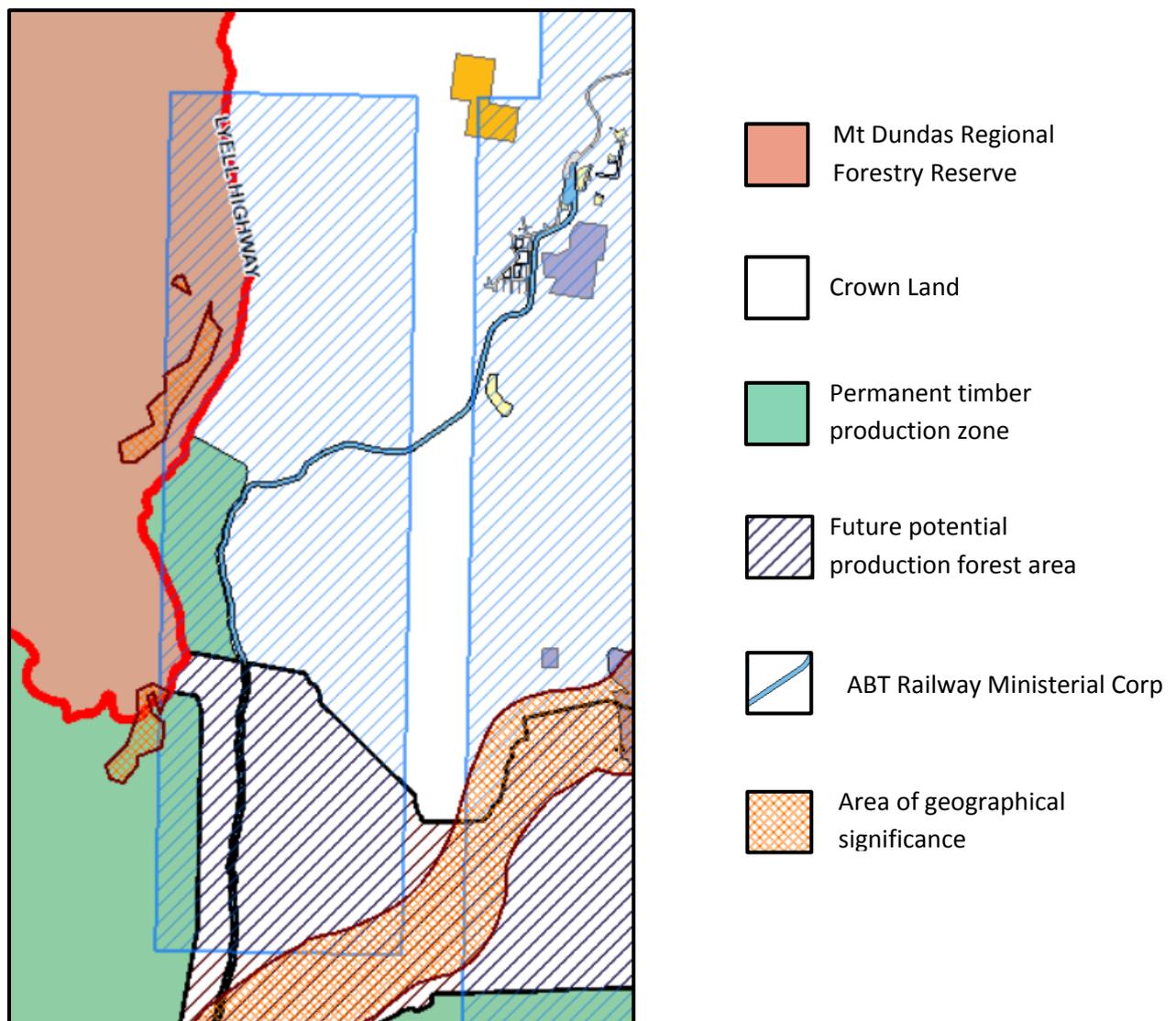


Figure 1.3: EL15/2015 Land tenure (Source MapList)

Current land tenure

Some 60% of the tenement is Crown land and another 20% in the south is earmarked by DPI/PWE Central Plan Register as 'Future potential production forest area' (see Figure 1.3). Another about 8% in a strip along the south-western boundary is classified under the *Forests Management Act, 2013* as permanent timber production zone (State forest) making almost 90% of the area approved for exploration under the MRDA (1995).

The south eastern edge of the Mt Dundas Regional Forestry Reserve established under the *Nature Conservation Act, 2002*, is located on the north-western boundary of EL15/2015. Exploration activities in the Regional Reserve would have to be sanctioned by the Mineral Exploration Working Group (MEWG) under the *Regional Forest Agreements Act, (RFA, 2002)*.

The West Coast Wilderness (ABT) Railway easement tracks centrally through the southern half of the Licence (ABT Railway Ministerial Corp, *ABT Railway Development Act, 1999*). Authorisation would be required to explore the easement and to use it as an access route to target areas.

There are no Nature Reserves, State Reserves or National Parks that would exclude exploration and mining within the tenement. There are no residential blocks under private freehold in the Licence area. There are no mine leases and no exploration licences under MRDA (1995) categories other than EL15/2015 (Category 1).

Historical setting

It seems unlikely that people of the local Peternidic language group (Ryan, 1996 in Huys, 2010, see Appendix E) ventured into the rugged inhospitable terrain of Sulphide/Halls/Sailor Jack creeks, more likely preferring to travel either through the Queen River Valley to the east (Corbett, 1980), or to range the heathy ridge along which the Strahan Highway now runs. No evidence of habitation or tool finds has been recorded. AMR acknowledges the ancestral first race inhabitants of the land and their descendants and undertakes exploration activities with due respect for Country and to elders both past and present.

The first European to explore the region on foot was Charles Gould who battled through the terrain in the 1860s. Gould experienced first-hand the inaccessible terrain that includes EL15/2015, taking more than two weeks to reach Macquarie Harbour from the West Coast Range – a journey he expected to complete in two days.

In 1881 the Conrad Lynch party found alluvial gold in the Queen River valley less than 3 km west of Sulphide Creek. Prospectors and miners migrated into the remote area after 1893 and by the late 1890's the alluvial deposits in the area had been worked for over 40,000 ounces of gold. Source lodes generally had disappointed - 'did not live any depth' (Zeehan and Dundas Herald, 16th November 1891), yielding about 3,000 recorded ounces to 1923 (The Mercury 11/1/1933). Anecdotally, these yield figures are deemed minima, as miners achieved a better price for their gold by stowing it and cashing it in Victoria.

One kilometre to the north of the current Licence area, the Macquarie and Woody Hill gold mines operated between 1887 and 1907. The Madam Howards Gold Mine (1888 -1895) was another 2 km further north.

The May Gold Mine (1903-1906) lay 1 km to the north east of Sulphide Creek.

The Princess Gold Mine (1887-1891, 1897/98) and the King River Gold Mine (1883-1895) were located one and two kilometres east (of north EL15/2015) respectively, with Harris' Reward (1895) 2 km east (of southern EL15/2015).

Within the EL15/2015 area, the Davie P.A (1909-1911) and Coupon deposits were explored (1902-1906, 1911-1913). Hall's Creek, Coupon and Gorings Creek were mined for alluvial gold.

An antimony/gold prospect near Rinadeena was explored in 1907.

Regional geological setting

The following notes can be referenced to the 1:250 000 South West Tasmania sheet (Brown et al, 2005), the Notes to the 1:50 000 Strahan (Baillie & Corbett, 1985) and 1:25 000 Strahan East (Vicary, 2004) sheets compiled by Mineral Resources Tasmania MRT (see Figure 1.4).

Exploration Licence 15/2015 is a 14 km² block in the east of the Henty Surface, which is a planar but eroded 250 km² surface gently sloping between the southern West Coast Range in the east and the Tasmanian west coast around Macquarie Harbour in the west (Gregory, 1903, in Baillie & Corbett). Slabs of NNW-striking Late Cambrian lower Owen Group strata and the northerly trending sub-vertical Middle Cambrian Central Volcanic Complex (CVC) of the Mt Read Volcanics comprise the eastern edge of the surface and, combined, form the West Coast Range as its rim. On the northern and southern ends of the Henty Surface, the outcropping rocks are equivalents of the Owen Group and the ultimate Tyndall Group of the Mt Read Volcanics series. The central bulk of the Surface, however, is underlain by younger rocks of the Silurian-Devonian Eldon Group (Gill and Banks, 1950) set in a synclinal, fault-bounded basin or graben herein termed the Henty Basin (so-named in Newnham (1995)).

The Eldon Group in this basin consists of up to 1800 m of shallow-marine sedimentary rocks, divided into the following formations of regional average thicknesses:

Bell Shale	420 m
Florence Quartzite	490 m
Keel Quartzite	120 m
Amber Slate	240 m
Crotty Quartzite	490 m.

Stratigraphically below the Eldon Group, and outcropping narrowly between the basin and its eastern edge are elements of an older, Ordovician sedimentary sequence:

Rinadeena Shale Formation / Gordon Limestone; and
Owen Group.

Regionally there is evidence for an easterly-vergent tectonic compression event in the Middle to Late Cambrian that established broad northerly trending folds and related fault trends in the area. The later rocks of the Henty Surface were deposited unconformably on this surface and were fractured and folded by Late Devonian (Tabberabberan) compression and wrenching (Cox, in Baillie and Corbett, 1985):

- DEV1 – steeply plunging major upright NNW open-to-tight folds with amplitudes of 4-5 km, axial surface cleavage. Bedding dips steeply SW or NE (e.g. Dubbil Barril Synclorium of Solomon 1962, axial in the Basin) with associated upright NNW trending fault systems and;
- DEV2 - WNW folds with shallow WNW plunge axial surface cleavage, associated with the Firewood Siding system FSF; and
- DEV3 - NW trending, plunging 30° to 90° NW, with NW sub-vertical axial surface cleavage.

At some stage, post-dating deposition and tilting of the Eldon Group, extensional stresses probably caused normal slippage along existing faults, forming the Henty Basin. The basin is broadly triangular, bound by the southerly dipping Firewood Siding Fault to the north, the easterly dipping Teepookana Fault to the south and westerly dipping Harvey Creek Fault and related faults to the east. The Harvey Creek Fault traverses EL15/2015 axially and probably is part of a series of faults along the subsiding basin margin. The Great Lyell / Owen Fault system runs roughly parallel to the HCF some 4 km to the East.

Recorded bedding orientations are sparse. Several records are consistent with the strong NNW near-vertical axial cleavage. Otherwise, the most common bedding records reflect a northerly or NNE orientation with steep or overturned dips to the east and west.

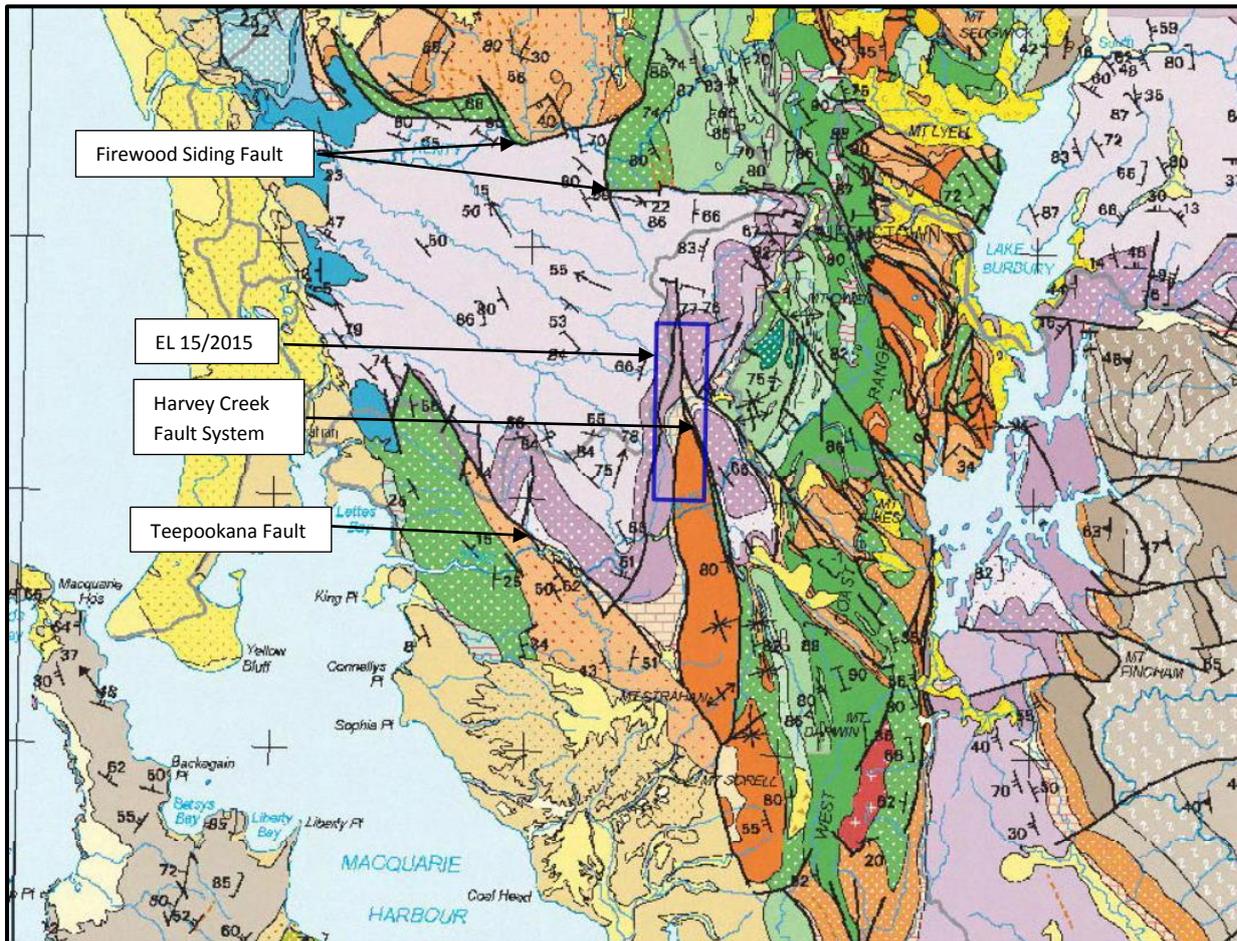


Figure 1.4: Regional Geology of EL 15/2015 (Excerpt from Brown et al, 2005)



Four of the five neighbouring quartz reef gold mines were hosted by Florence Formation quartzites, whereas Coupon, Rinadeena, Halls Creek, Davie Prospect, Anomalies 24-28 and Harris Reward anomalies occur in rocks of the Rinadeena / basal Gordon 'dirty' carbonate sequence. The Crotty Quartzite Formation appears to have hosted only the Princess Mine. The Bell Shale regionally appears to be barren. The Flannigans Flat reef prospect 6 km south is on the HCF trend and hosted by correlates of the EL15/2015 Owen Group rocks (micaceous quartzitic sandstones) (Calver C. pers. comm. in Poltock, 1985). To the east, gold deposits occur in Cambrian volcanic rocks, notably rhyolitic and andesitic porphyries, associated with the Great Lyell Fault. The gold mineralisation in EL15/2015 could represent remobilised material from deposits occurring in underlying Cambrian sequences (Poltock).

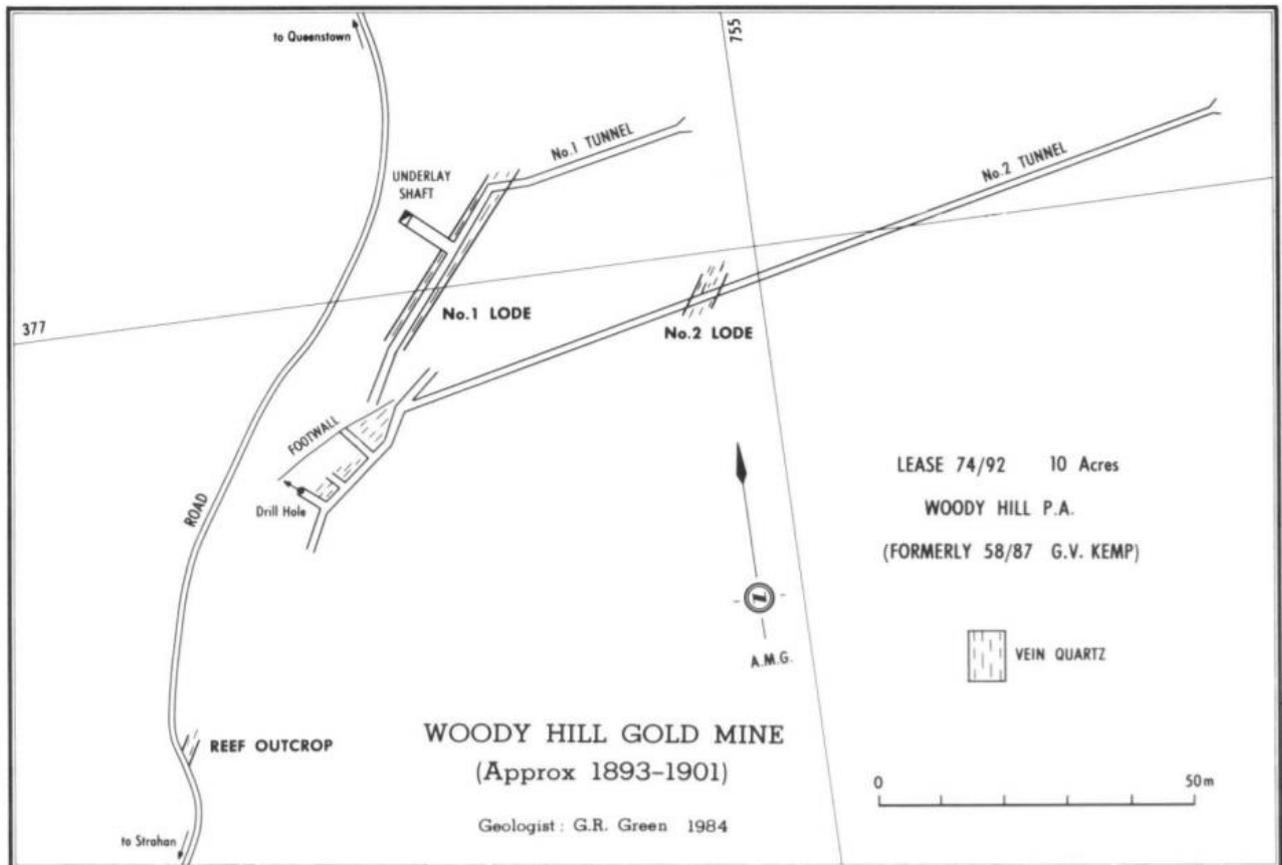


Figure 1.5: Plan of the nearby Woody Hill Gold Mine (1893-1901) (Green, 1985)

2. GEOLOGY OF THE TENEMENT

The complex tectonic history, inaccessibility, and lack of good outcrop and marker horizons make the geology of EL15/2015 currently obscure. The following notes have been summarised from an investigation of source literature and 2017/18 targeted field mapping. Figure 2.1 shows the distribution of rock types and broad stratigraphy on EL 15/2015, sourced from TheLIST on the MRT website.

Stratigraphy

The pastel lilac colour with wavelet texture represents the Silurian-Devonian Florence 'Quartzite' Formation (coded SDf on Figure 2.1). Where the Florence is mapped in the west part of EL15/2015, it is underlain by Silurian sedimentary rocks that correlate with the Crotty 'Quartzite' Formation (SDc – mauve with closely-spaced white dots). A non-conformable contact has been inferred for the entire distance – as noted by Baillie (1985), "*At several places the Strahan - Queenstown road cuts across a (strike-slip) fault between correlates of the Florence Quartzite and Crotty Quartzite*". Elsewhere in the area, the Lower Eldon 'Crotty' and possibly the 'Amber' equivalents are mapped as 'undifferentiated' (SDu – mauve with wider-spaced white dots). The contact between this SDu and the Florence formation is probably conformable and is traceable to 2 km north of Queenstown.

Rinadeena Shale (Ola – light yellow) is stratigraphically beneath the Crotty Formation and the contacts between these units in the centre and south of the area, might be conformable. The Lower Owen 'Conglomerate' wedge (COcl – burnt orange in Figure 1.4) is probably faulted against the Rinadeena and erosionally non-conformable with the Tyndall sliver (green) to its east.

Apart from this sliver of the Late Cambrian Tyndall marine volcanoclastic, there are no recorded igneous or volcanic rocks in the EL15/2015 area, although Leaman (2002) postulates a (probably Cambrian) granite mass some 4-5 km beneath to the east.

There is an outcrop of (possibly) the Gordon Limestone where Halls Creek departs the area. The Rinadeena Shale and Gordon Limestone are considered to be correlates (Baillie, 1985). The remaining lithology of interest is the quartz / quartz-carbonate Devonian veining that have proven to be sporadically auriferous in the area.

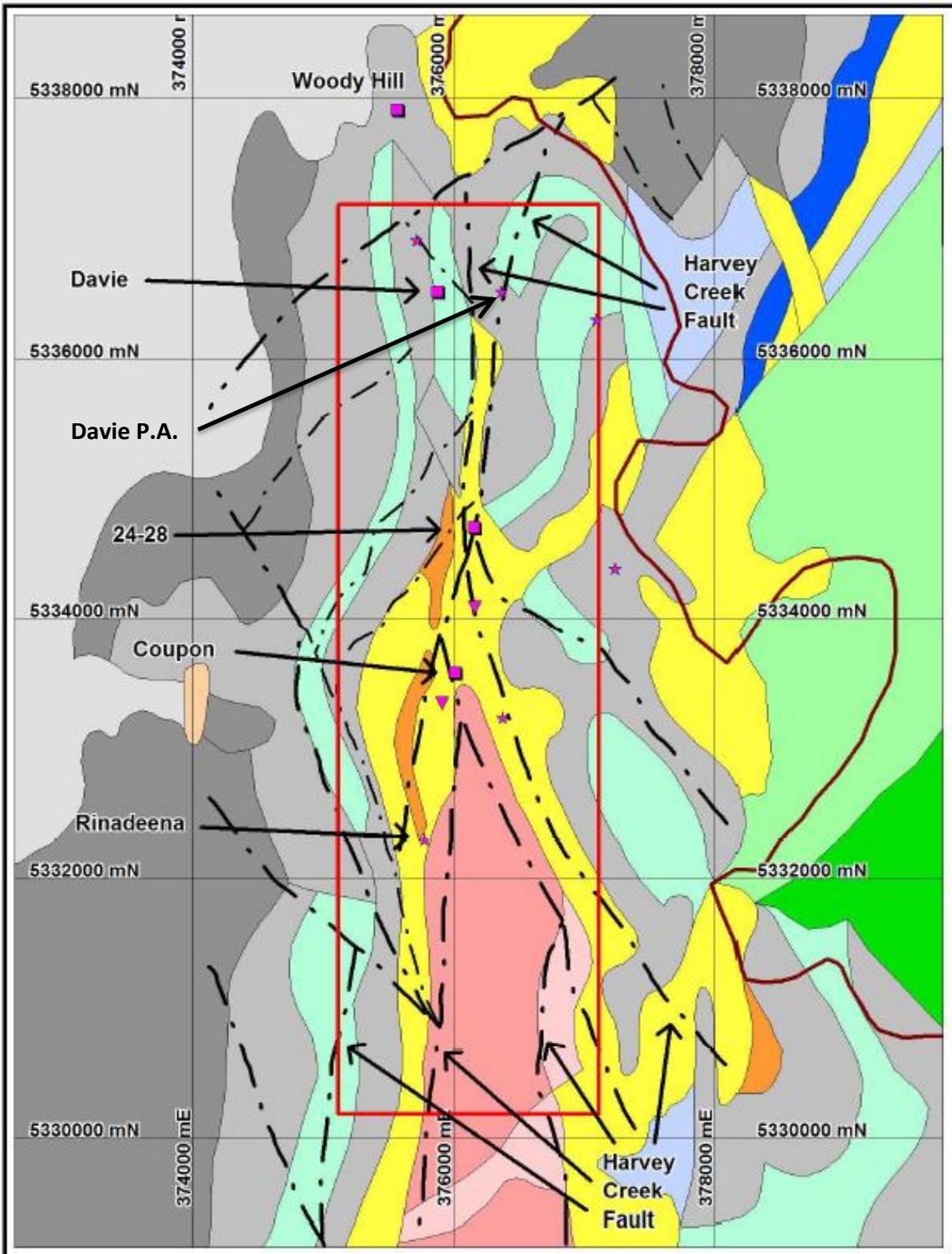
Lithology

The Florence Quartzite is exposed at several places on the Strahan (Lyell) Highway, often forming resistant strike ridges. It is a hard, fine-grained cream-beige quartzose sandstone. The Crotty Quartzite consists of a sequence of light coloured, often kaolinite-speckled fine-to-occasionally-coarse-grained orthoquartzite sandstone often thickly-bedded, with subordinate thin mudstone and grit beds, (Baillie, 1985). The base of the formation is exposed along the track between the Rinadeena ABT railway station and the Lyell Highway, but the top of the formation appears everywhere faulted against the overlying Florence Quartzite, which is discernible mainly by its 'cleaner appearance'.

The Rinadeena 'Shale' consists of interbedded slaty black calcareous or brown-grey siltstone and contains dirty often 'puggy' limestone beds laminated with mudstone.

The Owen Group rocks, although correlated with the lower Owen Conglomerate, present as grey-cream micaceous silicified sandstones, and occasionally siltstones, making them difficult to distinguish from the Silurian quartzites (Poltock, 1985).

Topographically, the resistant Siluro-Devonian and Late Cambrian quartzitic sandstones form NNW ridges. The valleys reveal erodible exposures of the Ordovician slates, siltstones and fine grained calcareous sandstones (Rinadeena shale), however, where ferruginous the sandstones in the Rinadeena Formation can be cliff-forming (e.g. Davie anomalies).



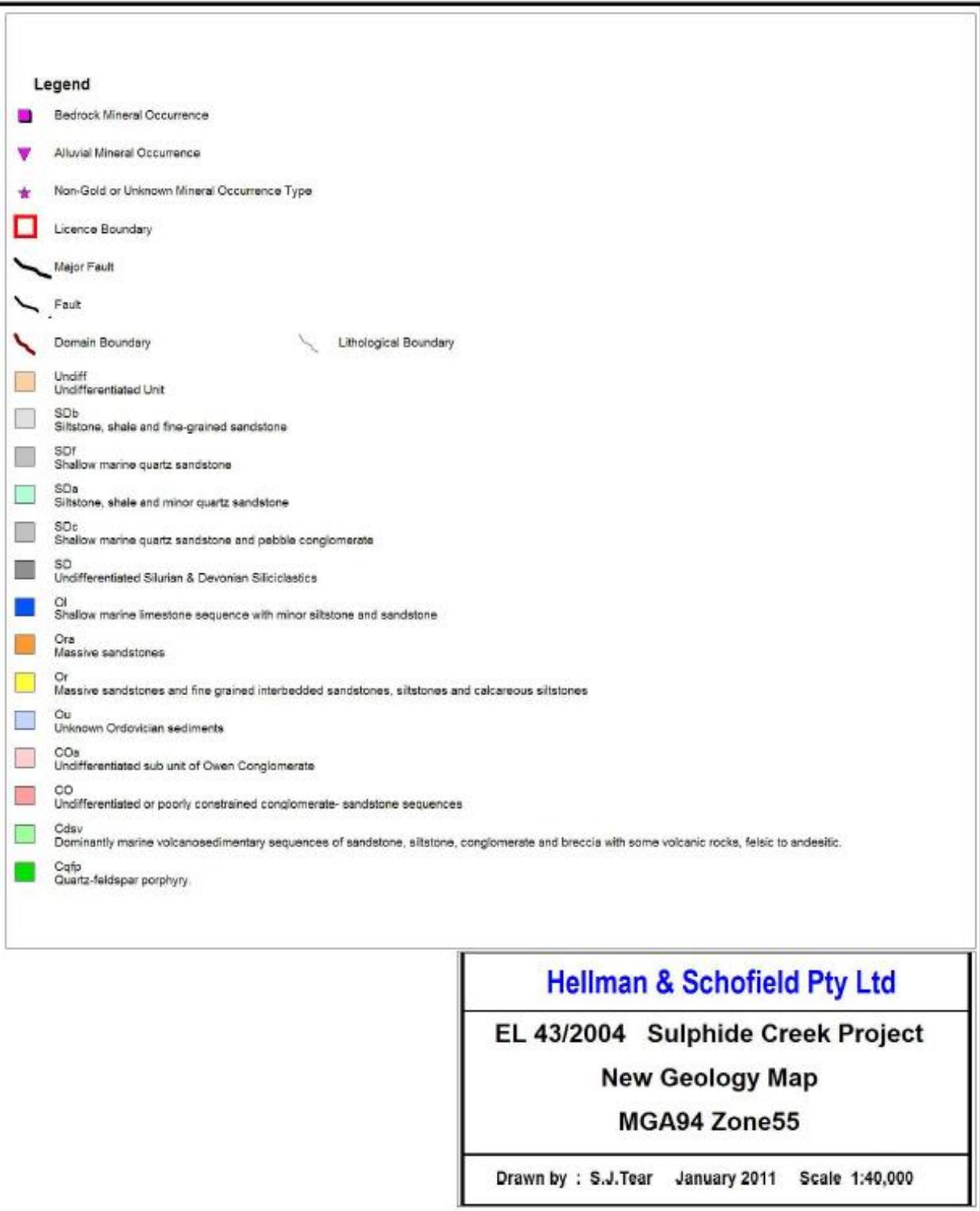


Figure 2.2 - 1: 40,000 New Interpretive Geology Map (Tear, 2011)

Structure

McDonald (1983) described the bedding at Gorings Creek as “a sequence of west facing rocks with a moderate-to-steep west dip and a strike slightly west of north.” Outcrop observed elsewhere on the Licence such as the Coupon area, is consistent with that observation. Structurally, the area has been postulated as part of the east limb of the northerly plunging Dubbil Barrel Synclinorium, but it is conceivable that the strata in the east of the Licence area also present as a faulted, matching northerly plunging anticline with the Owen Group at its core. This interpretation is consistent with Hellman & Schofield’s ‘New’ Geology Map at Figure 2.2 (Tear, 2011). This Map was reinterpreted from historical mapping and geophysical review particularly of magnetic and radiometric data (Cowan, 2011). It also displays newly interpreted faults, notably with NW and NE trending faults intersecting a strong North to NNE-trending sinistral strike slip fault.

Magnetic interpretation by Mitre Geophysics (Bishop, J. R., 1986) of the ‘Tyndall’ fault sliver at Harveys Creek shows a 50m to 60m wide body dipping steeply east and plunging north. “Further north in Sulphide Creek the faults coalesce, following shale and carbonate horizons, displacement primarily as bedding plane slip.” (McDonald. 1983).

Mineralisation

The mineralisation is Devonian in age and appears to be controlled by NNW trending fault structures (the HCF system). Documented styles of mineralisation include (discontinuous) auriferous shoots in quartz-pyrite veining (McDonald, 1983) hosted in moderately silicified Florence quartzite; and low-grade gold-arsenic-iron associations to over 180m depth associated with iron oxide / quartz stockwork veining and/or pervasive silicification in either narrow (1-2m) shear zones in siltstones or fault breccias in fractured quartzites, most often in contact with shales or limestones. Broader disseminated gold mineralisation in the oxidised zone near-surface might be related to some form of supergene or physical (dissolution) enrichment. The prospects have been interpreted as geochemical hydrothermal leakage via the deep-seated Harvey Creek Fault remobilisation from a deeper VHMS deposit (from Tear, 2011).

The Coupon anomaly

The Coupon anomaly (Figure 2.3) occurs in the Ordovician calcareous shallow marine Rinadeena Formation that dips east at approximately 60°, concentrated in a limonitic sandstone-shale sequence in an area that has been disrupted by the northerly HCF and a series of east-west faults. Newnham (1995) suggests that diagenetic and basin-tectonic hydrothermal solutions leached Au, As and iron sulphides (and sporadic elevated Sb values) from underlying Mt Read Volcanics and concentrated these metals near surface in after encountering reactive limestones and permeable friable sandstones. This resulted in a large Carlin-style Au-As geological anomaly that has been defined by surface soil and rock sampling and may have potential for a low grade open cut resource.

The dark grey siltstones in the basal interbedded limestone / siltstone unit are calcite-veined and the limestones unveined but degraded to clays. This is overlain by another interbedded 70m unit of leached limonitic friable quartz-veined light grey pyritic sandstone, dark grey limestone weathered to orange clays, and puggy seams of dark grey shaly siltstone; in turn overlain by a thicker dirty limestone.

Highest grade mineralisation (1-2 g/t Au) appears to be associated with the sandstone-limestone sequence about 40m either side of one east-west sub-vertical fault. Mineralisation outside of this zone at Coupon is scattered, low-grade and very limited in size, and probably largely confined to the other shear zones. The shape of the soil anomaly is almost certainly dispersion of the mineralisation from the outcropping fault zones. Tear (2011) adds that at Coupon “the most recent historical thinking is that gold mineralisation in fresh rock is

associated with narrow (1-2m) shear zones in siltstones and narrow vein breccia zones in sandstones”.

Coupon anomaly is about 400m x 50m with a potential resource of 35,000 oz Au.

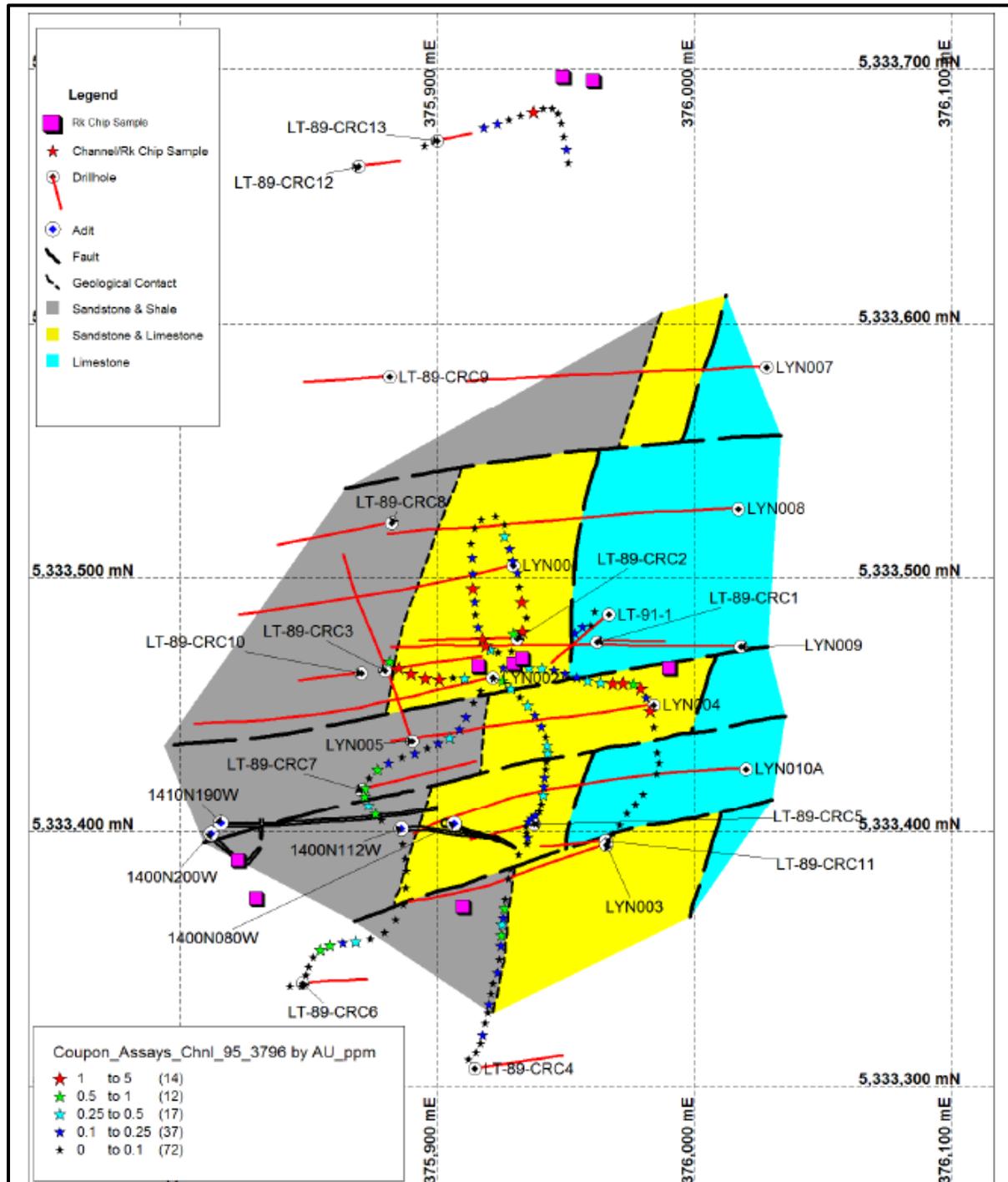


Figure 2.3: Coupon prospect exploration results map (source Reid, 2001; AGD66 Zone 55)

Davie Prospect (from Reid 2010)

The bulk of the alteration at Davie is pervasive and sporadic veined iron oxide (mainly limonite with minor hematite). Semi-pervasive silica alteration, of weak intensity, accompanied by quartz veinlets to 5mm width is often evident within indurated sandstones.

Minor sericite is apparent locally. The deposit presents as a cliff up to 25m high comprised by ferruginated, foliated sandstone and fault breccia. This outstanding land form is part of the Ordovician Rinadeena Formation, lying in faulted contact with fine to medium-grained quartz sandstone of the Siluro-Devonian Crotty Quartzite.

The Harvey Creek and Harris Faults are two significant NNW aligned structures separating these sedimentary units and (probably) intersect in the prospect in a north-westerly direction. Mineralisation is possibly sandwiched between the two faults in an anticline fold closure, or tracks a reidel shear extension fracture (R') caused by wrenching between the two faults (ref: Keele, 1994).

Reid states that potential for fault offset Au mineralisation on the eastern (footwall) side of the Harvey Creek Fault (and Sulphide Creek) remains undetermined but note that the historical description of the Davie P.A. mineralisation matches Reid's description of Davie Prospect. The deposits are either related, or one and the same.

This prospect probably contains less than 5,000 oz Au to 20m depth.

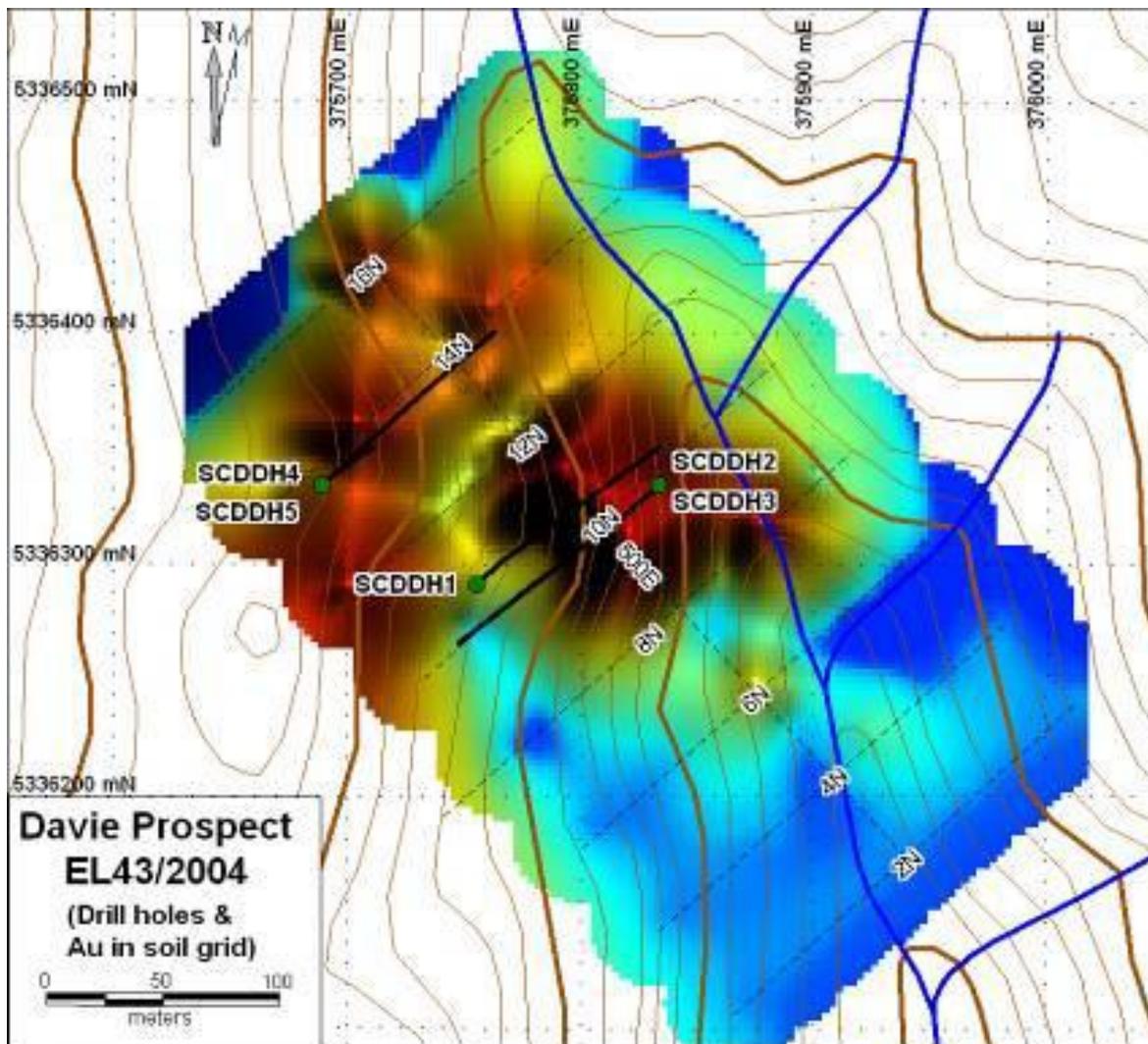


Figure 2.4: Davie Prospect plan view showing grid and drill hole locations over a gridded Gold in soils image (note: AGD66, Zone55) (from Reid, 2010).

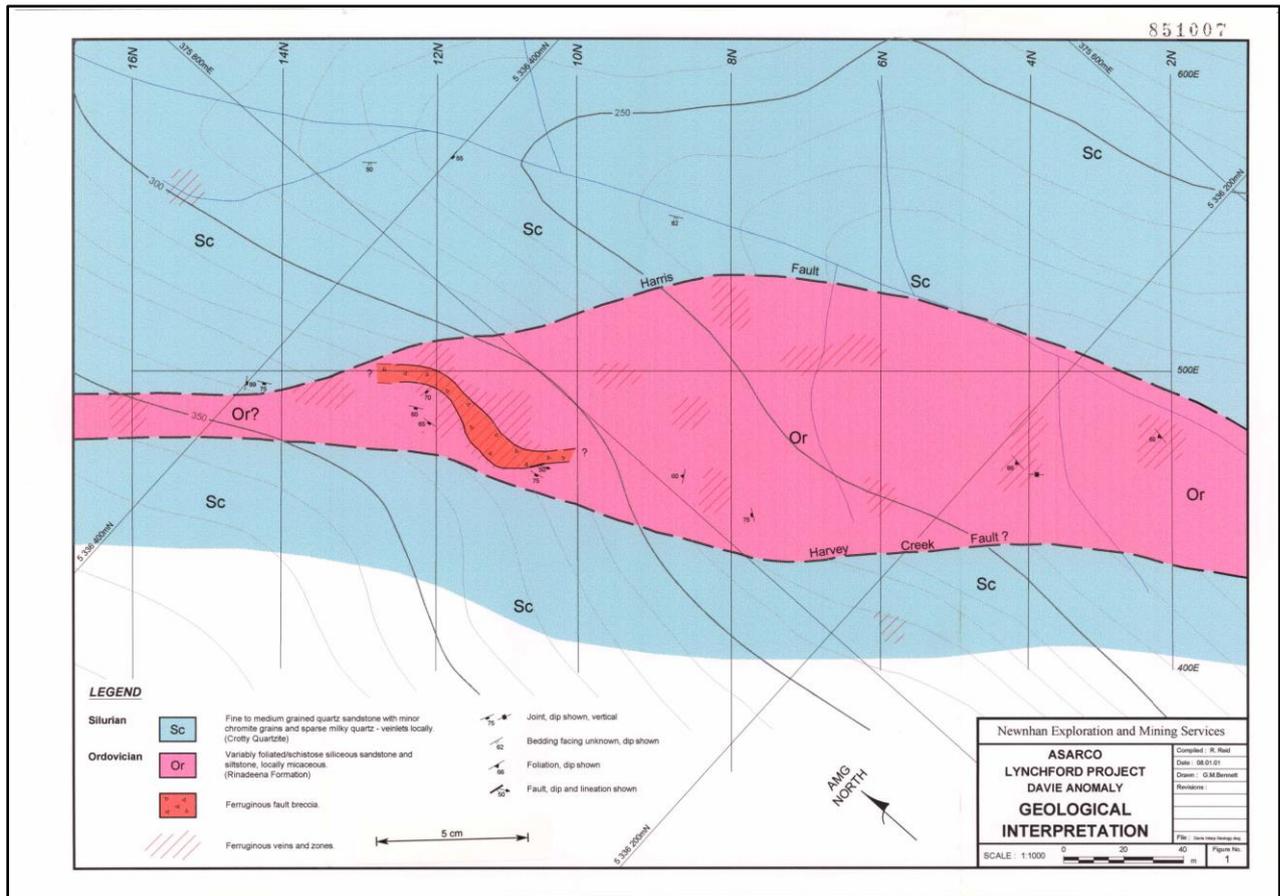


Figure 2.5: Interpretation of Davie Prospect (Reid, 2001)

Other prospects

Anomalies 24-28 is a similar-style prospect to Coupon, in the same host rocks. The >100 ppb soil anomaly covers an area of 250m x 50m trending due north along an interpreted fault intersection. Size is likely less than 10,000 oz Au to 20m depth.

At Rinadeena, sparse historical records (Appendix A) suggest that a concentration of 50% to 60% antimony (stibnite nodules in weathered limestone pug) did not persist to a 12-metre depth. The deposit could contain up to 5 g/t gold, although other assays showed 'nil'.

Davies P.A. is likely to have been located (TIGER, MRT) on a ridge on the eastern headwaters of Sulphide Creek – across the valley from Davie Prospect. From historical accounts (Appendix A) it demonstrated a combination of rich quartz shoots and possibly disseminated ferruginous gold in a deposit almost identical, but perhaps richer than Davie Prospect. Tentatively Davie P.A. could have a potential of 20,000 oz Au.

3. PREVIOUS EXPLORATION

Past exploration work in the EL15/2015 licence area includes stream sediment sampling, soil sampling grids on anomalous prospects, airborne magnetics and a localised ground magnetic survey. Historical drilling consists of 23 RC and diamond drillholes for 2,683m on the Coupon prospect, and the drilling of five diamond cored holes for 742m at the Davie Prospect. Previous licence-holder, Shree commissioned an exhaustive data compilation of historical exploration (Tear, 2011) and an assessment of publicly available geophysical data including 3D interpretation (Cowan, 2011), with which it re-interpreted the geology of the area and proposed further exploration targets.

Devonian quartz veins

In the twenty years after 1883, it must be assumed that all creeks and adjacent tributaries of the Queen, Princess and King Rivers were prospected thoroughly for alluvial gold. There were alluvial workings at Coupon; and Sulphide, Gorings and Halls Creeks. Exploration of alluvial source reefs generally followed alluvial discoveries. The Davie P.A. and Coupon prospects, and antimony/gold vein discoveries at Rinadeena and Harveys Creek were pursued with exploratory adits (extensively at Davie P.A.) but despite initial optimism, no prospect progressed to production.

McDonald, in 1983, identified the association of small gold prospects hosted by Silurian and Ordovician rocks with strong structural deformation on the eastern rim of the part of the Henty Surface area.

Woody Hill Gold Mine (1887) to the north, produced 4.6 kg of gold at 17.6 g/t, from adits developed along two NE-trending metre-wide quartz veins within Siluro-Devonian quartzites adjacent to the HCF.

The Davie P.A. exploratory workings (about 376 200 mE, 5336 200 mN GDA94) consisted of a northerly(?) 7m-long surface trench on a gossanous breccia, a 150m adit to access these surface concentrations at 30m depth, an exploratory adit on a surface quartz vein and a 4m vertical shaft. The main drive was developed on northerly haematitic sandstone and gold-bearing agglomerate/breccia, before chasing higher grade shoots in narrow quartz reefs (14 to 150 g/t Au). These workings have not been properly located by contemporary exploration (Newnham 1993 / Reid 2010) and might not be part of the 'Davie prospect' drilled more recently.

The Coupon workings are situated on a ridge between Harvey's and Goring's creeks. At least six tunnels, plus shafts and winzes were developed into gold-bearing limonitic zones. Production records are incomplete, but in 1913, 32 t of ore was extracted at recovered grade of 12 g/t gold.

The Rinadeena Reward Claim was developed on a 6m-wide stibnite-rich outcrop with veins up to 0.7m wide assaying 50%-60% antimony and gold between zero and 12 g/t Au. A 4m vertical shaft was driven at the surface and a 120m horizontal adit was driven into black pug, (presumably weathered (Rinadeena Fm) limestone, although the surface outcrop was reported as separating 'slate and quartzite') to intersect the lode at 10m depth. A mine was not developed. About 'half a mile' from the ABT railway and plotted 100m from it on the TIGER database, the exact location of this claim is not known.

Metallic sulphides

There was no committed exploration in the half-century between the decline of the West Coast gold rush (say 1914) and 1965, when Pickands Mather held the ground for three years as part of a wider search for metallic sulphide minerals.

Carlin and remobilised structurally controlled gold (Henty-style)

Over the last 35 years, exploration has focused on finding gold in lower-grade sediment-hosted or blind, structural style (Henty) deposits (see Table).

Summary of exploration prior to EL 15/2015

Period	Company	Activity and result
1883 - 1915	Prospecting	Alluvial gold prospecting and mining led to quartz reef explorations at Coupon and Davie P.A. Costs of access, transport and treatment plant exceeded anticipated resources of gold (as did mining at adjacent May, Woody Hill and Macquarie mines).
1965 - 1968	Pickands Mather	Regional stream geochemistry survey excluding gold sampling. No sulphide metal anomalies found.
1981 - 1987	Trikon and Electrolytic Zinc (EZ) SPL806 and EL9/84 McDonald I.R. (1983). (Poltock and Summons, 1985, Poltock, 1986)	Stream sediment and rock-chip sampling program exploring for Carlin-style deposit. Several tungsten anomalies (tungsten is correlated with gold in structurally active sedimentary basins). 1984 follow-up stream sampling identified gold anomalies in tributaries of Halls Creek, but no detectable gold 'near' the headwaters of Sulphide Creek. A magnetic anomaly in the SE of the tenement was mapped and sampled to reveal the wedge of Cambrian (Tyndall) volcanoclastics. Geophysical / geological interpretation identified the HCF (Harvey Creek Fault). In 1984, rockchips and B-C horizon soil sampled along the HCF (155 samples). Significant gold-arsenic anomalies identified over a 3km strike length (original Coupon workings discovered – 4 g/t Au in Qz; 'Anomalies 24-28' – 16 g/t Au; and '1415' – 3.4 g/t in siltstone). ['1415' yet unidentified – probably Davie prospect]. "The study concluded that the zone of basin-margin faulting running down the eastern margin ... could be a potential area of host rocks for fine grained gold mineralisation".
1988 - 1990	Cyprus Gold Australia Corporation. Poltock (1989)	Cyprus explored for Carlin-style, vein and Henty style gold mineralisation. 600 soil samples at 25m spacing successfully confirmed and defined the three As-Au anomalous areas. Coupon shown to be 400m x 150m, with soil samples exceeding 0.1g/t gold and 100 ppm arsenic, best rockchip samples from veined, fractured rocks. Anomalism commonly associated with limonitic weathering, probably after pyrite-arsenopyrite. Rock chip samples returned up to 21 g/t gold. As-Au anomalism at Anomalies 24-28 was 400m x 75m, with float samples up to 16 g/t Au and 0.44% arsenic. Anomaly defined at Davie prospect 400m x 100m with As values to 0.56% and Au to 14g/t in a grab sample from old workings. 13 RC holes at Coupon, for a total of 737m. Most holes abandoned prior to reaching target depths, the deepest being 82m. Best results in CRC3 - 24m at 1.1g/t gold and 0.25% arsenic from 16 m depth. Strong levels of arsenic anomalism were encountered in other holes, but no significant gold intercepts.
1991 - 1992	Perilya-Noranda	Completed sample infilling of previous HCF grids to 200m spacing over 4km. Au-anomalous soil samples up to 0.17 g/t up to 300m south of the

	(Newnham, 2000)	<p>Coupon workings. Further sampling north and south of Anomalies 24-28 failed to define new targets.</p> <p>Remapping revealed Coupon as comprising steeply east-dipping quartzite/siltstone on the eastern limb of a northwest-trending anticline, cut by NW trending shears and faults with dips of 30 to 80° NE. These zones are characterized by shearing, quartz veins and limonite (after pyrite-arsenopyrite). Mineralisation seen as largely confined to the shear zones, with little penetration of wall rocks. Channel sampling of access tracks at Coupon gave (either of?) 5 m at 5.76 g/t Au, 8 m at 2.32 g/t, 25m at 2.00 g/t and 10 m at 1.45 g/t.</p> <p>Re-assessment of gold-bearing intervals in CRC3 showed disseminated pyrite-arsenopyrite in quartz veins, within a siltstone-shale sequence. DDH LT91-1 was drilled to test a mineralised shear zone but bad ground caused abandonment at 61m.</p>
1993 - 1995	Goldstream Mining & Titan Resources	<p>Channel sampling and 9 cored holes for 1886m at Coupon (Figure <->) exploring for fine-grained sedimentary-hosted gold, suggesting Au-As anomalism in the area occurs in carbonate-rich lithologies and a folded sandstone / limestone unit (Gordon Limestone/Rinadeena) adjacent to HCF.</p> <p>First 3 holes suffered poor recoveries and only one sample was >1.0 g/t Au, but established that Au-As mineralisation obtained on the surface and in CRC3 is controlled by an east-trending shear zone. Surface channel sampling near this E-W fault returned >1.0 g/t Au over 100m strike length (Newnham, 1995).</p> <p>Next 2 holes tested the E-W shear zone, with LYN004 intersecting 70m of leached limonitic sandstone / siltstone, Au-As anomalous with best intercept of 8m @ 1.24g/t Au.</p> <p>The final 4 holes tested the shear zone target at depth but found mineralisation to be restricted to a narrow fault with little mineralisation pervading out into the wall rock sandstones.</p> <p>Goldstream's conclusion: drilling results were disappointing and despite suggesting a possible resource of 7,000 to 32,000 oz Au per 50m depth (Newnham 1995 – "200,000 to 300,000 tonnes of mineralisation per 50 vertical metres, possibly grading in the 1 to 3 g/t gold range"), the Licence was relinquished.</p>
1996 - 1999	RGC and Aberfoyle - CRAE EL 2/94 & EL47/83	<p>Sulphide Creek area acquired as part of a greater sediment-hosted gold exploration initiative, but no exploration work in the current Sulphide Creek tenement.</p>
1999 – 2002	ASARCO EL 15/99 (35 km ²)	<p>Review of previous exploration of Coupon concluded that: the depth of surface oxidation is variable; gold correlates with mustard-coloured limonitic sandstone; carbonate (quartz) veining is barren; there might be supergene enrichment of the gold; and orientation of the mineralisation at Coupon is still uncertain. However, Coupon was considered to have been properly tested.</p> <p>Focus switched to the Davie (and 24-28) prospect(s) seeking a Carlin-style or a structurally controlled 'Henty-style' deposit. A ferruginous silicified</p>

		<p>cliff of breccia near Davie prospect was identified as a target, potentially a fault-breccia hosting sulphide mineralization. A foot access track was cut from the Lyell Highway to the anomaly (see Figure <>) and then 1950m of grid was cut comprising 200m-long 50m-spaced cross lines over a 400m baseline, oriented NW. 79 x 25m-spaced C-horizon soil and 46 rock chip samples obtained a peak gold soil value of 0.2 g/t and with a strong arsenic association, and a peak gold rock value of 0.86g/t. An area of overlap of the gold and arsenic anomalies became the target area for drilling.</p> <p>Robert Reid (2001 Newnham Exploration Services report) suggested Davie gold hydrothermal alteration may have developed in a dextral wrench fault regime, associated with the intersection of the NNW-trending Harris Creek and Harvey Creek Faults (Figure <>). A wrench fault model would indicate potential for gold mineralisation in steeply plunging lensoidal shoots. Reid recommended the drilling of 3 inclined DDHs to test the geochemical target.</p> <p>At the 24-28 adit, grab sample material yielded less than 0.5g/t Au, whilst attempts to locate the old Davie workings and the recorded 41m long drive on the Rinadeena Antimony deposit were unsuccessful.</p> <p>Corporate goals relating to sediment-hosted disseminated gold and structural deposits were not met, and Asarco relinquished the tenement which became vacant.</p>
2004 - 2008	Zinico NL (Zelos Resources EL 43/2004)	<p>During 2005 Zelos Resources NL (Operator) drilled three HQ diamond holes at Davie Prospect for 350m, to intersect at depth the co-incident gold and arsenic soil geochemical anomalies. This drilling discovered a zone of weakly auriferous quartz-sulphide stockwork veining up to 50m true width, in silicified sandstones to a depth of 100m below surface (Figure <>).</p> <p>Drillhole SCDDH2 contained 16m @ 0.58g/t Au from 44m downhole and 4m @ 0.79g/t from 119m downhole. These two intervals are part of a coherent mineralisation zone of 82m @ 0.4g/t Au from 44m (peak gold value is 1m @ 1g/t). The Au-As mineralisation is in a vein stockwork system hosted in brecciated slightly-altered fine-grained siliceous sandstone proximal to a steeply dipping fault breccia interpreted as part of the HCF.</p> <p>SCDDH1 DDH1 was drilled sub parallel to ground surface and so remained within the oxidation zone <25m deep. It intersected the same gold zone at shallower depths albeit oxidised with possible depletion and giving a best grade of 6.5m @ 0.49g/t Au from 91m within a 62m auriferous zone (downhole width).</p> <p>DDD3 was terminated at 69m, 30m short<?> because of bad drilling conditions possibly related to drilling down-dip along a major fault plane. The "Exploration Results" (JORC classification) show presence of gold at the prospect that 'would be mineable in other settings'.</p> <p>Multi-element assays indicated that arsenic correlates with gold in the Davie area.</p> <p>No significant work in 2006-2008.</p>

2008 - 2013	Shree EL 43/2004	<p>In 2010, Shree drilled two follow-up cored holes on Davie prospect, targeting down-plunge mineralisation 100m to the NW of SC DDH 1-3 to outline the potential size and gold concentration of the deposit.</p> <p>SC DDH4 targeted the 100m+ wide (to 107ppb) Au soil anomaly and confirmed the presence of low-grade gold mineralisation, best core sample result 3m section from 31.5m depth @ 1.26 g/t Au, in an 18.5m section from 19.0m @ 0.5 g/t.</p> <p>SC DDH5 confirmed the presence of low-grade gold mineralisation to >180m depth, best result 3m section from 164m depth @ 1.29 g/t Au, in a 10m section from 159m @ 0.83 g/t. Also a 14m section from 37m @ 0.52 g/t.</p> <p>In 2011 and 2012, Hellman & Schofield undertook a data compilation and geological review of all available information from Sulphide Creek tenement and recommended exploration targets. The study found that there are large zones of diffuse mineralisation including pervasive silica alteration associated with a complex fault pattern immediately proximal to the Harvey Creek Fault. It suggested that although there is a lack of tightly controlled high-grade gold mineralisation, the broad low-grade mineralisation leaves potential for a series of low-grade gold deposits in the tenement area.</p> <p>In 2011 Shree commissioned Cowan Geodata Services to study all available airborne radiometric and magnetic geophysical survey data from Sulphide Creek and environs. Cowan's study recommended sulphide targets and facilitated the generation of a new interpretation of the area's geology by Hellman & Schofield (Tear, 2011).</p> <p>A hyperspectral (HyLogger) study of 6 entire cores from Davies and Coupon holes was carried out in 2012 to help identify hydrothermal alteration haloes. A spatial association could be observed between the anomalous Au assays and spectroscopic signatures of an alteration assemblage comprising dickite plus hematite, minus white mica and kaolin, occurring at a boundary in mica chemistry composition. The dickite +/- iron oxide zones were interpreted to be structurally controlled fluid pathways and important vectors to future mineralisation search.</p> <p>No evidence was observed of alunite, pyrophyllite or topaz, as found in the high sulphide parts of the Mt Lyell and Henty mineral systems.</p> <p>Shree determined that while exploration results to date were geologically encouraging (with a caveated potential resource figure of 30-50Mt @ 0.75-1g/t gold for 700,000 to 1 million oz Au) the mineralisation was weak and deep. Company resources were required elsewhere (Nelson Bay Iron Ore Project), and Shree surrendered the tenement.</p>
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4. EXPLORATION RATIONALE

Philosophy

The objective of mineral exploration is to enable estimation of the quantity, quality and spatial dimensions of a resource to a defined level of confidence, prior to consideration for extraction. AMR believes that the most rigorous way to economically explore for mineral resources at regional, local and deposit/prospect scales is a scientific approach to mitigate uncertainty around the investment decision. There are three steps.

1. Integrate all accessible existing information and relevant evidence into a hypothesis and a preferred geological model(s).
2. Design and implement the exploration program itself, to test the premises of the hypothesis and fill information gaps in the draft geological model. The results of the exploration program prove, reinforce, adjust or discard the hypothesis and model.
3. If the premises can be assumed to be sufficiently true, then the hypothesis is supported, and the third stage is to apply the preferred model to the specific deposit(s) to reach a quantitative estimate of overall resources and economics (which might entail further proof by drilling).

Status

The facts arising from AMR's own desktop research and field validation are:

- there is a large zone of diffuse mineralisation including pervasive silica alteration associated with a complex fault pattern (NW, NE and N-S structural interaction) immediately proximal to the Harvey Creek Fault within the Rinadeena Formation and Lower Silurian clastic sediments (Tear, 2011).
- there is gold in anomalous concentrations at three locations in the Licence area;
- the historical Davies P.A. and Rinadeena Antimony prospects have not been located, validated or investigated;
- a resource has not been convincingly quantified at any of these locations, but there is potential for at least two low-grade disseminated ore bodies;
- quartz/carbonate vein shoots, although possibly gold-rich have not historically proven to be economic if mined in isolation but offer value if they can be extracted along with the disseminated resources. FeO-rich quartz / pure quartz / stockwork vein parageneses remain ambiguous (Reid, 2010).
- historical finds of economic concentrations of gold at the surface have not been proved at depth;
- there is uncertainty around the Coupon RC drill hole locations and recoveries;
- geochemical analysis of stream sediments has assumed an arsenic-gold correlation (gold content has rarely been assayed) perhaps relevant to disseminated deposits but not sheet veins. McDonald (1983) observes a correlation between raised As values in the area and higher concentrations of Fe and Mn known for fixing arsenic through oxidation reactions;
- the anomaly styles have been interpreted, but the mechanism is not definite. Understanding of the ore-forming mechanism enables better definition of the ore body composition, quantification of the resources and discoveries of further gold concentrations;
- structurally-controlled Henty-style deposits have been postulated for the area, but the nature and actual location of faults remains vague (i.e. mapped structures are interpreted only). Location of fault intersections is integral to this style of deposit;

- Some Hellman & Schofield and Cowan recommendations and implications have not been assessed and considered for follow-up (Davie/Coupon core has been HyLogged); and
- the barren host lithologies, uninspiring geophysical and geochemical data and co-location of the ABT Railway Easement and the strip of only prospective ground make the southern 4 km² of EL15/2015 currently of low priority for minerals exploration.

Exploration objectives

AMR's specific exploration objectives for this tenement are drawn from the facts above.

They are:

- 1) Develop the knowledge base of the three known gold anomalies Coupon, Davie Prospect and Anomalies 24-28, to "enable estimation of the quantity, quality and spatial dimensions of the resource to a defined level of confidence, prior to consideration for extraction". There are two goals: (1) to define higher-grade shallow concentrations <50m deep in the disseminated bodies at the expense of cutting tonnages (volume); and (2) to determine the deposits' potential as indicators of deeper ore deposits.
 - a) Stage 1 is targeted field mapping and sampling to ground-proof AMR's draft model and depositional mechanism of each deposit.
 - b) Stage 2 is to generate and justify a preliminary resource estimate.
 - c) Stage 3 is drilling to define the nature of the most prospective ore bodies to JORC criteria.
- 2) Resolve the location of the Davie P.A., Rinadeena Antimony and Harveys Creek prospects and include them under Objective 1.

Note: Davie P.A. could be a mis-plot of Davie Prospect; and Rinadeena could be the Harveys Creek gold/antimony prospect. A 1982 traverse of the Gorings Creek area failed to find evidence of the Rinadeena workings, and there is a 'total' absence of Sb in geochemical samples from that area (McDonald).
- 3) Locate new, and confirm established, anomalous quartz-carbonate vein, structural and disseminated gold concentrations by targeted stream and soil assays. This program simultaneously can be used to assess alluvial prospects as part of an overall Lease resource picture. Note: the low-grade disseminated silicified quartz limonite/pyrite deposits tend to shed weak stream gold anomalies (max. 0.015 ppm).
- 4) The project should benefit from commissioning a research project associated with AMR's nearby Diamond Hill tenement (EL16/2015) into the reasons for apparent deterioration of surface concentrations of auriferous veins with depth (and laterally).
- 5) Scope and resource a geological structure study specifying mapping, photogeological and geophysical study of lineations, research on other structurally-controlled sites (e.g. Henty), regional (west coast) models, geophysics, association of ferruginous fault breccia with a particular lineation, etc; and target mapping/drilling in combination with other objectives and field activities.
- 6) Incorporate Hellman & Schofield recommendations into the above objectives. The field work above incorporates 'delineation of structure, spatial distribution of likely host rocks and the recognition of alteration zones' recommended as the keys to possible success'. AMR will consider H&S proposed nine sites as part of Drilling at Stage 3.
- 7) Also recommended for success by H&S was a high resolution airborne magnetic and radiometric survey.
- 8) Assess mineral potential of the Owen/Tyndall/Florence contacts south of Rinadeena Station before considering partial relinquishment of the southern 4 km² block.

Company synergies

AMR is concurrently exploring for orogenic vein-hosted and fault-hosted gold on its EL16/2015 Diamond Hill / E12 Lake Margaret Road block 5 km to the north of the Sulphide Creek block. If Sulphide Creek offers further orogenic quartz reef prospects as explored historically, then economies of scale could make development viable across these Lease areas.

The presence of high-grade antimony in the same deposit type also offers synergistic value in concurrent exploration with the gold prospects, as is similar with barite shows at Diamond Hill and copper at Lake Margaret Road.

4. EXPLORATION RESULTS – Work completed in EL15/2015 for 2016/17 and 2017/18

Exploration during the first two years of the Licence to 4 March 2018 consisted of:

1. lithology and stratigraphy - review and summary of exploration records to date;
2. tectonics and structure - research and application of regional structural geology from geological literature;
3. mineralisation - research into occurrences and structurally controlled sediment- and fault-hosted gold deposits;
4. research into historical records of mining, prospecting and exploration;
5. interpretation of research towards draft models - review and interpretation of electromagnetic, gravity and radiometric results to inform structural modelling;
6. purchase of equipment in anticipation of exploration program;

and in the field:

7. reconnaissance visits to the Licence area and regional overview;
8. site access to the Davie Prospect, Anomalies 24-28 and Rinadeena /Gorings Creek area
9. scout geological mapping and chip sampling to validate existing map occurrences;
10. commencement of a stream sediment gold sampling program.

Lithology and stratigraphy

Outcomes:

Existing maps of EL15/2015 are open to improvement and have been reinterpreted by AMR and previous explorers. Field proofing is restricted because outcrops are obscured or inaccessible making detailed mapping difficult without clearing and/or excavation.

Historical interpretations cannot be assumed to be correct (e.g. extrapolated rock units, faults and boundaries).

Gold deposit types are likely to be associated with different host rock units – disseminated deposits with Rinadeena Siltstone Formation and orogenic quartz veins with Florence Quartzite Formation.

The accepted interpretation of some rock units has been questioned, and not demonstrably resolved:

- Is the Owen equivalent in fact an Eldon Group equivalent? (Poltock, 1985)
- Is the 'Tyndall sliver' in fact Rinadeena Formation? (Tear 2011/ Cowan, 2011)
- The Rinadeena Formation might persist into the north east corner of the Licence area.

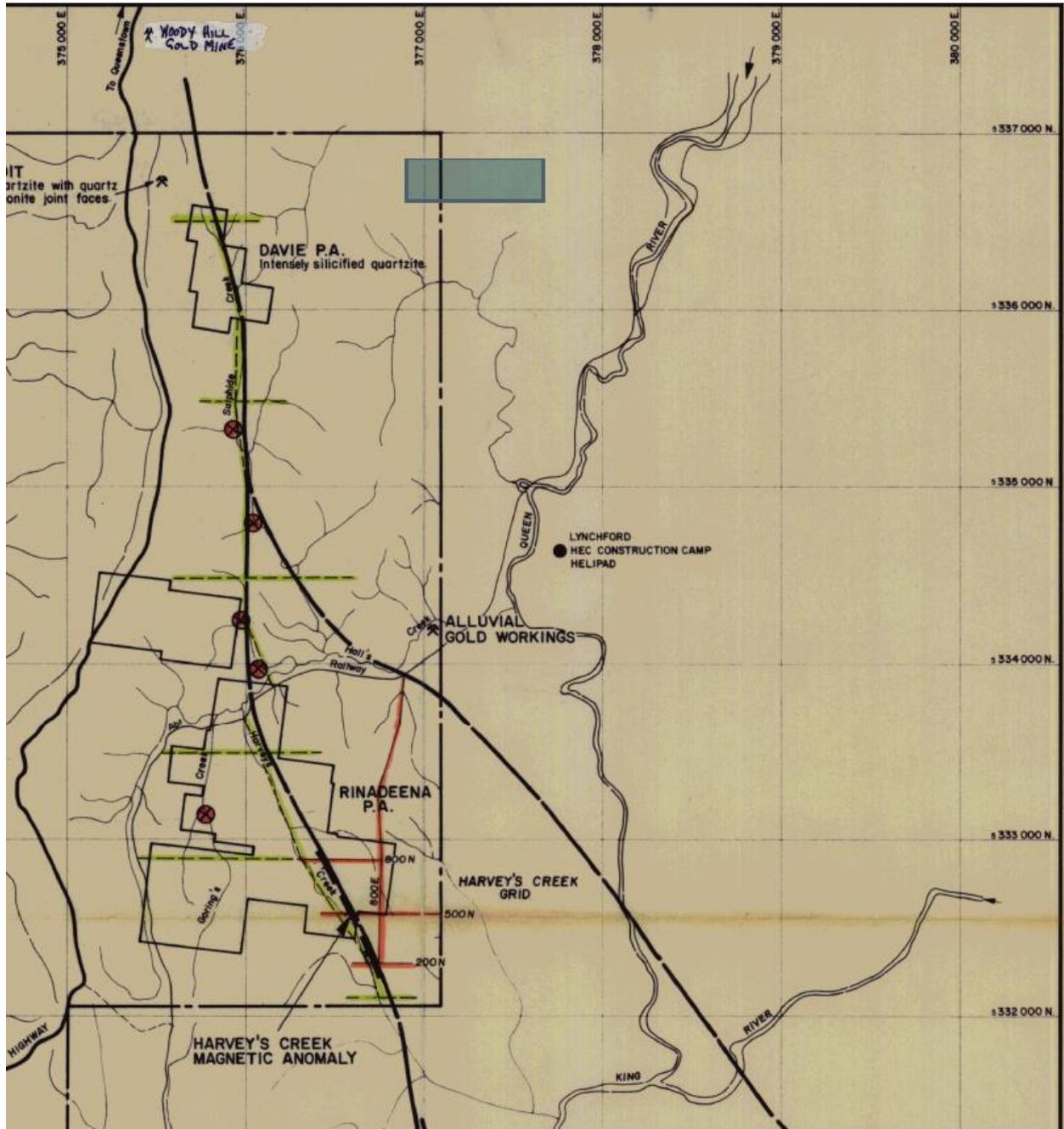


Figure 4.1: Trikon map showing historical prospecting tenements (Note Davie P.A. at Davie Prospect site) From Poltock, (1986)

Implications:

- Stratigraphy and lithology in the area remain of importance for achieving AMR’s exploration objectives:
 - The ‘Owen’ wedge underlying much of the southern part of EL15/2015 might host orogenic quartz vein deposits; and the Tyndall sliver might contain disseminated deposits.
 - Davie P.A. is probably located in the north east (east of Davie Prospect).
 - Sharp linear lithological discontinuities/boundaries in outcrop indicate faulting or bedding changes, both of which enable conditions for hydrothermal vein deposits. Stratigraphy can help identify marker beds and structural geometry.

- Concentration of gold in veins can be associated with rheology of adjacent rock types. Brittle lithologies (e.g. silicified silts and sandstones/quartzites) are more likely to host hydrothermally emplaced ore bodies whereas the more ductile lithologies may have acted to seal the traps.
- In some areas (Victorian goldfields, Carolina Slate Belt) carbonate and carbonaceous lithologies (eg graphitic shales) are thought to chemically catalyse gold deposition.
- More needs to be known about surface and sub-surface geology. Despite paucity of data sites AMR should continue to refine geological maps through mapping and evidence-based reinterpretation.

Tectonics and structure

Outcomes:

- The block is comprised by mostly moderate to steep westerly facing NNW to North trending beds of post late Cambrian siliceous and often silicified rocks.
- The lower Eldon Group is expected to be at least 500m thick overlying theoretical Cambrian gold prospective source rocks.
- These strata are dissected by no less than six lineation orientations that may represent shears, thrusts, bedding, wrench faulting or combinations of these. There are almost certainly more faults than those already mapped or postulated.
- The HCF does not need to be a crustal scale fault, although it does parallel the Tasmanian Devonian gold 'trend' (NNW). If its primary planes dip west, then the HCF is in fact wrongly oriented to be the hydrothermal feeder of gold in the Licence area. If the HCF isn't the main conduit, then the gold-bearing fluids might have exploited instead the permeability of the Great Lyell Fault then westerly-trending secondary faults to reach the shear-zones and jogs of the HCF and extensional, transcurrent fault traps in the area.
- Structural mapping at Coupon and Anomaly 24-28 by Shree revealed a west-dipping shear trend (like Davie Prospect) which is poorly tested by much of the previous west directed drilling. The only east-directed drill holes are either short or outside the zone of main Au anomalism.
- Shree identified a shallow (30°) southerly dipping quartz vein and stockworks in ferruginous sandstone at the Rinadeena Saddle and along trend north of Anomalies 24-28.

Implications:

- Geological maps, cross-sections and models will be inherently speculative.
- Mapped curvilinear faults (in the horizontal plane) were probably caused by vectors of tectonic movement that exploited various pre-existing planes of weakness (e.g. NNW regional trend probably exploited a combination of more northerly bedding and north-westerly trending faults).
- The six structural trends recognisable in geophysical, topographical and geological lineaments result in a set of surface polygons of rock, bound by probable planes of relative displacements. In the vertical these planes dip at varying angles creating another dimension of complexity to the structure of the area.
- Fault traps probably trend at varying orientations that were extensional at hydrothermal injection (but could also have also been perpendicular to regional compression). That is, auriferous veins and gold shoots won't necessarily share a common trend.
- The Coupon RC drilling might have been ineffective.

Mineralisation mechanisms and patterns

AMR has not excluded all four types of gold deposit being present in EL15/2015, in association:

- Sheet veins
- Fe-rich fault-fed stockworks in structural traps ABOVE fault intersections. The pattern of copper mineralisation mimics gold anomalies (Davie Prospect – see Reid 2011) presenting an IOCG association
- Carlin-style replacement of carbonate in dirty limestones with silicification; and
- Erosionary alluvial deposits.

Outcomes:

- In EL15/2015, as in the west coast region, gold occurs in a NNW-trending belt that can be related to trends in deep crustal gravity differentials ('gravity worms' of Murphy et al, 2004). Also, regionally, the gold mineralisation rarely occurs beyond 5 km laterally from, and west of the northerly trending Great Lyell Fault.
- The quartz vein geometry will reflect the hashed permeability architecture (faults and lithologies) that existed prior to the injection of Late Devonian hydrothermal pulses. The regional paleo-stress field presumably influenced crystallization/solidification in traps after the powerful surface-directed orogenic pulses dissipated. The preferential concentration of gold in the quartz into ore shoots probably depended on localised pressure (primarily) and temperature conditions.
- No other minerals (apart from stibnite) have been found in economic quantities or concentrations.

Implications:

- The prospective potential in EL15/2015 is gold in Devonian shear zones and veins.
- The northern part of the Licence area probably holds the best potential for economic mineralisation.
- Here are three known targets, Coupon, Davies Prospect and Anomalies 24-28 and at least two further targets (Davies P.A. and Rinadeena / Harvey's Creek gold/antimony) to be developed to at least preliminary resource figures.
- Despite previous resource aspirations of more than 700,000 ounces Au (Shree, 2013), AMR advises that a cursory assessment of data to date and conservative assumptions suggests a figure of 60,000 ounces in situ is a more realistic starting figure, based on small scale open-cut extraction to 20 metres depth from surface. The Coupon anomaly, with uncertain drilling results, and the un-relocated Davie P.A. together constitute 85% of this estimate. AMR's exploration Goal is to firm up such figures.

Historical records of mining, prospecting and exploration

Outcomes:

- Extensive searches of the Trove database reveal records of gold exploration from the 'West Coast Gold rush' of 1893-1910. Up to 1895, 3,000 ounces of hard rock gold and 40,000 ounces of alluvial gold from the Queenstown area were reported in Tasmania (Appendix A).
- None of the prospects in the Sulphide Creek area proceeded to production, the implication being that the gold concentrations deteriorated laterally and with depth. Similar deteriorations were recorded throughout the State (e.g. Princess, May, Lefroy, Macquarie/Woody Hill). Discontinuation of these ventures was most often because of ore shoots 'petering out', a lack of development capital (which implies

that gold production wasn't paying its own way), costs (supplies, services, access and stamping plant), water ingress, lack of labour availability (War and Mt Lyell Copper), and poor reputation of the field (a Mt Huxley controversy, hardship, sporadic gold occurrences).

- Quartz vein lodes varied in orientation and, where auriferous averaged 2.5 feet wide.
- The obvious surface prospects in the region were discovered by searching creeks (e.g. May, King River) or chipping at outcropping quartz veins (e.g. Macquarie).
- Subsequent exploration has uncovered disseminated mineralisation. The discovery of the Davie P.A. prospect drew the Launceston Daily Telegraph's mining journalist to express, "It is the opinion of many that if ever gold is found in appreciable and payable quantities in the Lyell district it will be contained in a gossanous formation like the present one; rather than in quartz reefs, where it is generally very fine and difficult to save".

Implications:

- AMR's exploration target is to exceed 50,000 ounces of resource. To achieve this, AMR's exploration would need to demonstrate the same quantum of gold as recorded mined for the entire west coast goldfield in a decade.
- Proving more than 50,000 ounces of gold resources from Devonian veins at Sulphide Creek will require:
 - Proving of existing disseminated deposits' grade and volume (tonnage) at mineable depths and establishment of a mineable, sensitive extraction method; and/or
 - discovery of the reason for spatial deterioration of auriferous ore concentrations in orogenic veins to establish the potential for extensions or further ore bodies; and/or
 - evidence of larger Beaconsfield or Henty-style deposits; and/or
 - exploitation of economies of scale through securing further ground prospective for gold.
- AMR will need to consider all advantages offered by improvements in exploration and transport technology, local and regional infrastructure, geological knowledge, and geophysical and geochemical techniques.
- AMR must pursue a rigorous, methodical but inexpensive exploration program.
- The project should benefit from commissioning a research project into the reasons for apparent deterioration of surface concentrations of auriferous veins with depth (and laterally). Preliminary research suggests that chemical supergene enrichment does not concentrate gold in the top of quartz veins.

Catchment-based stream sediment pan-concentrate sampling program

Outcomes:

- During the reporting period, AMR commenced a stream sediment sampling program (Appendix B<>). Dense vegetation regrowth after 12 consecutive high-growth seasons hampered the efforts and restricted sampling to 22 in total.
- The upper reaches of Sulphide Creek, draining the two Davie anomalies (12 samples), and the projected zone of intersection of the Harveys Creek and Harris faults in the Florence Formation (10 samples) were taken. Previous sampling by the EZ company (1981,1983) and Poltock (1985) was plotted on a field map to which the 2018 samples will be added on the return of assay results.

- These samples are also being assayed element analysis to identify to trace levels arsenic, antimony, lead, copper, silver, and iron as well as gold.
- No visible gold was detected in the 22 samples.
- Most previous samples (Poltock, Shree) have not sampled for gold on the assumption that arsenic is a better indicator of disseminated gold deposits.

Implications:

- Gold assays are not expected to exceed 20 ppb in samples that drain the disseminated deposits. Levels above 100 ppb will probably indicate quartz vein concentrations nearby in the catchment.
- Arsenic highs will be tempered against iron and manganese content.
- Stream sediment sampling is an inexact analysis and values are relative only, not quantitatively comparable (see Appendix B). These samples are indicative of gold concentrations and will assist in locating such but should not be used to infer economic value.

Interpretation and draft models**Outcomes:**

- The draft model for the entire Licence area is a block of north-NNW steeply-dipping west facing beds of Silurian fine-grained siliciclastic and Ordovician fine grained interbedded siltstones and calcareous rocks, and Late Cambrian micaceous sandstones, multiply fractured by at least three Devonian orogenic stress episodes into a hash of irregularly-shaped and sized three-dimensional fault blocks. Orogenic hydrothermal fluids were injected into the fractured block from crustal-depth North to NNW-trending belts in the late Devonian. The model postulates that these fluids exploited westerly trending transcurrent faults plumbing upward towards the faults and rocks adjacent to the Harvey Creek Fault. The fluids were either already auriferous in the subcrustal environment, or scavenged gold from deeply-buried rocks in the crust. Either way, they deposited predominantly quartz and sometimes quartz carbonate veins with 'shoots' containing concentrations of gold in low pressure traps in the westerly faults or carried the dissolved gold until reaching the low pressure shear zones of the HFC system where deposition of gold, iron and quartz (silicification, thin veining and stockworks) took place in brittle competent rocks adjacent to less permeable ductile lithologies.
- Evidence for the model is drawn from historical reports on geological mapping, radiometric images (Cowan, 2011), and regional geophysics surveys.
- Development of the regional model would benefit from further information on:
 - Location, dimensions and orientation of quartz-rich deposits in the 'plumbing' of the fracture system and accurate fault/vein locations and orientations
 - Location and persistence of gold concentrations in the quartz-vein geometry
 - Location and persistence of gold concentrations in brittle shear zones
 - Identification of marker beds within the recognised stratigraphic units
 - Accurate locations of key host lithologies
 - Mapping of fault strikes, trends and dips including nature and track of the 'Harvey Creek Fault'.
 - Net sense of faulting and accurate displacements on faults

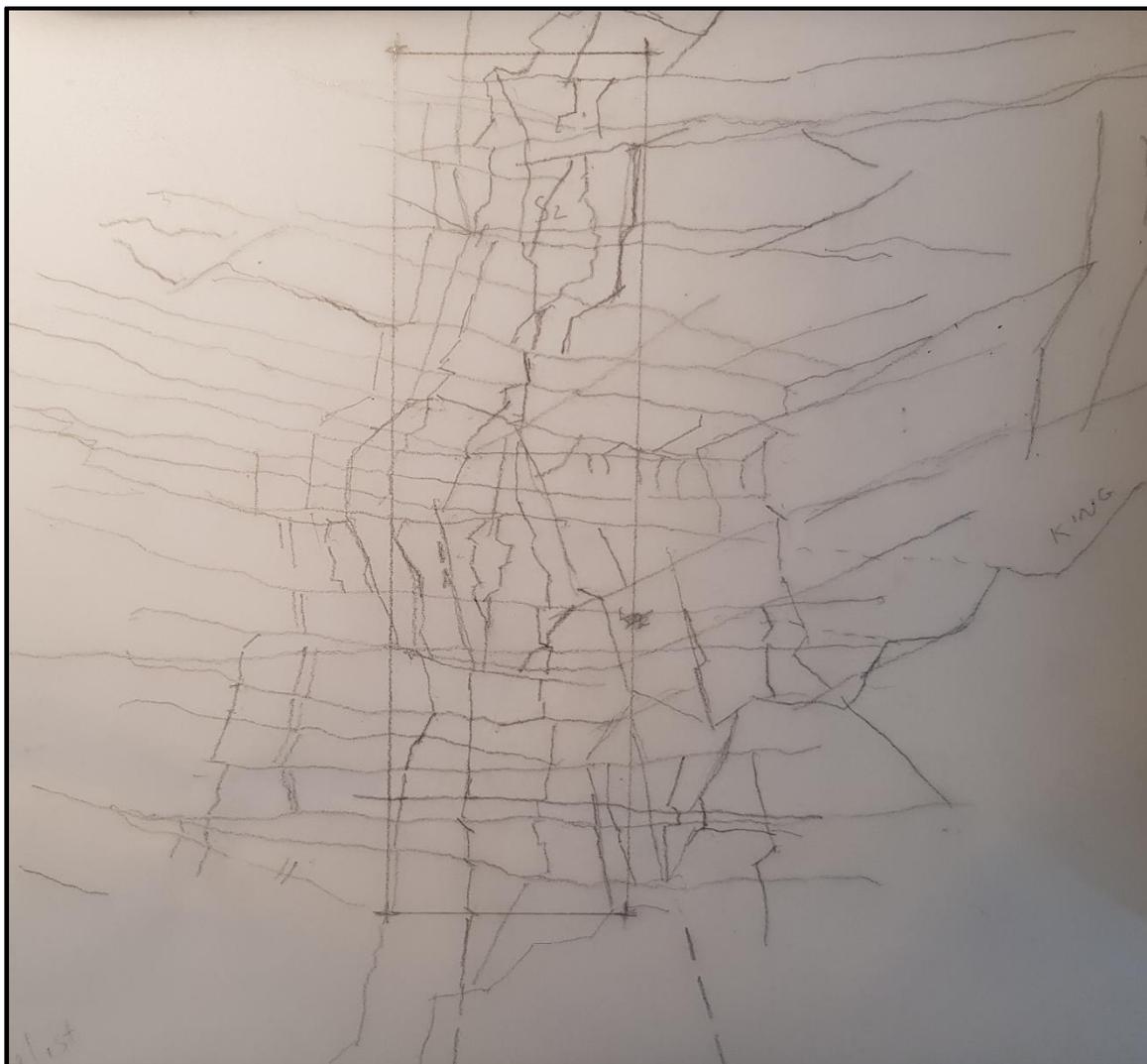


Figure 4.2: EL15/2015 Lineations from aerial photographic, topographic and geophysical maps

- Current gaps for generating deposit-scale models are:
 - Local surface geology (lithologies and faults)
 - Local location, dimensions and orientation of veins
 - Local location, dimensions and orientation of ore shoots
 - Gold concentrations in ore shoots/veins in three dimensions
 - Persistence of all features with depth (veins, shoots, concentrations, lithologies and structures)
- AMR developed a ballpark resource potential based on the model and exploration results to date of around 60,000 ounces Au in the top 20m section across all known deposits on EL15/2015, with Coupon and Davie P.A. comprising some 85% of the estimate. This concurs broadly with Newnham's (1995) ballpark estimate for Coupon of 200,000 to 300,000 ounces Au per 50 vertical metres. Pal's (2012) estimate for the tenement's potential of 700,000 to 1 million might be of in situ resources at less-constrained depths (150+ metres).
- Four GIS/geological software packages were assessed for digitising of existing and future data.

Implications:

- AMR currently favours a structurally-controlled shear zone trap model for the stockwork-style disseminated gold deposits, more likely hosted in shear jogs than fault intersections. In this model the traps were fed by orogenic fluids exploiting transcurrent faults that thus might be spatially associated with the mineralisation. Exploration should target the information necessary to close the information gaps for computer-modelling prospects based on this model.
- Axial cleavage and fault wedge models should not be discarded; therefore, exploration should inform the potential for these styles of deposits to be present.
- Further regional and Licence-scale information should be compiled on location, dimensions and orientation of veins.
- Further regional and Licence-scale information should be compiled on Yolande River Sequence expression and stratigraphy.
- Further regional and Licence-scale information should be compiled from sources on regional structure including presence of folding, and fault orientations.
- Prospects should be mapped in detail for veins, shoots, concentrations, lithologies and structures.
- The freeware Leapfrog, Grass GIS (US Government) or QGIS packages have sufficient functionality for initial spatial data management and presentation. The purchase of either a Maptek VULCAN, GeoSoft TARGET or Datamine licence is pending funding arrangements or a demonstrated need for full functionality (e.g. borehole logging and presentation, resource estimation).

Purchase of equipment in anticipation of exploration program

Outcomes:

- During the reporting period, AMR purchased, stored and restored two 900m-capable Boart Longyear cored drilling rigs; a second-hand field-capable vehicle and minor sundry drilling equipment.

Implications:

- Even with equipment, the further costs of drilling (access and set-up, consumables, labour, etc) will require funding. AMR is working on two strategies to fund the drilling phase of exploration.
- As finances are critical, optimal targeting of boreholes is a prerequisite for drilling - requiring more data acquisition, research and detailed analysis and modelling. This will consume resources including time. Drilling is likely to be delayed beyond the original two-year expectation (unless funding arrangements demand earlier).

5. PROPOSED WORK PROGRAM

1. Continue stream sediment sampling program (50 sites = 10 man-days):
 - Priorities are Davie P.A. and potential daylighting intersections on major faults (Henty style structural).
 - Engage cutters to expedite access (and grid for detailed mapping) (10 man-days)
 - Integrate with search for possible source lodes, vein outcrop mapping and rock samples.
2. Locate and map Davie P.A. in detail (6 days)
3. Design shallow drilling program for Davie P.A.
4. Follow up implications of HyLogger survey to design next exploration at Coupon and Davie Prospect.
5. Targeted field mapping and sampling to ground-proof AMR's draft model and depositional mechanism at Coupon and Davie Prospect
6. Search for Rinadeena and Harveys Creek prospects (historical records and site investigations)
7. Assess mineral potential of the Owen/Tyndall/Florence contacts south of Rinadeena Station
8. Review structural interpretation to identify potential significant fault intersections. Scope and resource a geological structure study.
9. Structure the draft model in freeware packages and populate with preliminary data. Obtain quote for VULCAN, Target or Datamine.

Estimated costs Year 3

Stream sediments	\$ 20,000
Foot tracks	\$ 5,000
Mapping	\$ 7,000
Geology	\$ 20,000
Supplementary	\$ 5,000
Tenement Admin	\$ 3,000
Total Program	\$ 60,000

6. ENVIRONMENTAL, CULTURAL HERITAGE

No works as specified by the *Mineral Exploration Code of Practice* (Bacon & Pemberton, 2012) or 'controlled actions' (*EPBCA*, 1999) were undertaken during the period.

Field work on public land consisted of outcrop recording and chip sampling, and stream sediment panning only (process description in Appendix B).

Access was by two persons by foot during Summer months only from roadside or fire trails, with minimal damage to regrown common native species (predominantly manuka, bauera and cutting grass). No track cutting, or gridding was undertaken, nor was there any risk to the registered listings of Geographical or Conservation Significance as identified on the Land Information System Tasmania.

Both the geologist and field assistant searched and viewed images of plants of conservational significance for familiarity prior to the program. Movement through scrub and swampy areas was undertaken to alert fauna including frogs, lizards and snakes.

The nearest record of aboriginal relics is from the Queen River valley (Corbett, 1980) 2 km to the east of the Licence area. Aboriginal inhabitation of the steep heavily-vegetated ridges and gullies is unlikely (Appendix E). Apart from the restored ABT West Coast Wilderness Railway, there is little known evidence of white cultural heritage elements of historical value on EL16/2015 despite a century of mineral exploration, gold panning, logging, and settler and farm settlements. There are sparse, overgrown historical excavation depressions, trenching, exploration tunnels, at least eight adits and three recorded shafts.

7. EXPENDITURE 2016/17 and 2017/18

Exploration Expenditure EL15/2015	April to March 2016/2017	April to March 2017/2018
Field program	\$5,705	\$6,718
Geology	\$6,677	\$11,853
Exploration Equipment	\$7,723	\$21,531
Tenement Administration	\$3,634	\$2,152
Services	Nil	Nil
TOTAL EXPENDITURE	\$23,739	\$42,226

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